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versally to parasites and food and makes an elaborate attempt to show that inheritance and climate are of minor importance. With this goes an unfortunate tendency to start with a thesis and "prove" it instead of starting with the facts and seeing what they prove.

Worst of all the author makes categorical statements which neither he nor any one else has proved: "The foods produced in the north could produce in combination with other favorable factors prevailing there, a strong physique and a strong brain, but not a fine nervous system and brain. The digestive organs were too much overburdened, for instance, with the assimilation of starch in northern latitudes, and the nerve fiber could not become as fine as that which was nourished on sugar." All this and much more is stated without a single qualification, as if it were a well demonstrated geographical truth, whereas it is merely an interesting hypothesis which is worth investigation. Nevertheless, Professor Binder's book well deserves reading. It stresses a great truth which geographers, economists, and historians must some day recognize, namely that the health of a people is at least as important as the material wealth of their country.

ELLSWORTH HUNTINGTON

A TEXTBOOK OF PRINCIPLES OF HUMAN GEOGRAPHY

ELLSWORTH HUNTINGTON AND S. W. CUSHING. **Principles of Human Geography.** xiv and 430 pp.; maps, diagrs., ills., index. John Wiley & Sons, Inc., New York; Chapman & Hall, Ltd., London, 1920. $3.50. 9 x 6 inches.

This is a textbook designed "to set forth the great principles of geography in its human aspects," to make clear "the relation of the physiographic environment to man's activities." In general, the arrangement of material and the allotment of space are commendable. Two-thirds of the book is devoted chiefly to the direct responses of man to the great elements of the physical environment—to location, land forms, water bodies, soil and minerals, and climate. The last third deals for the most part with man and his work in the leading climatic realms but includes brief chapters on the world's diet, man's changing surroundings, and the elements of political geography. The book is noteworthy for its many crisp, picturesque passages, some of which are written in a truly fascinating manner. Such discussions as that of the Kirghiz nomads (pp. 12–21) will help to arouse in students a lively interest in human geography. Many of the questions and problems at the ends of the chapters are adapted to promote clear and original thinking on the part of the student.

In spite of its good qualities the book, in the judgment of the reviewer, fails in its purpose and, except perhaps when used with caution by well-trained teachers, cannot give the "solid grounding" in human relationships which it was intended to provide.

1. The treatment is not consistently adapted to students of a given degree of maturity but varies from that appropriate in the elementary school to that suitable for the later years of the university. Pedagogically this is a serious defect. Such attempts to aid the young reader as that made on page 168 in indicating parenthetically the correct pronunciation of the word "prospecting" will prove amusing to more mature students.

2. In avoiding a technical treatment of the physical environment the authors have gone so far in some cases that the student doubtless will not get a clear understanding of the *effect of the environment on life*. The authors' viewpoint is reflected in the statement that "for practical purposes it makes relatively little difference how a plain or mountain originates" (p. 81). But it is important, for example, that the student shall understand the *characteristics* of delta plains, flood plains, lake plains, glacial plains, etc. (largely ignored in this book), if there is to be more than a superficial understanding of life responses in such areas. Certainly it would be unfortunate if the student shared the opinion of the authors that "under similar conditions of location, soil, and climate, plains of all kinds are much alike in being level places where the soil is deep" (p. 81); for most plains are not level, and in some of them the soil is not deep. Similarly the student would understand better the *effects* of climate if more were said concerning the *characteristics* of climates of different types.

3. A textbook should distinguish sharply between fact and theory; failure to do so tends to develop the cocksure, half-baked opinions frequently held by college sophomores. This is not done in the case of the tetrahedral theory (p. 51 *et seq.*) and of Dr. Huntington's theories concerning climatic changes and their human relations (pp. 370–374).

4. Although most of the illustrations are well chosen, some are not well placed or are not made to supplement the text effectively. Thus a map showing the migration of the cotton boll weevil appears on page 306 but is not referred to until pages 360 and 375 are

reached. Some of the maps, unfortunately, are open to much more serious criticism. For example, Figure 53 (p. 178) is intended to show the distribution of the more important deposits of iron ore but omits those of Brazil, Newfoundland, and Cuba. Figure 61 (p. 191) is designed to show the distribution of coal production but indicates no production for China and India, both of which furnished more in the last year of normal production (1913) than Canada, the output of which is shown. No dates are indicated for any of the production maps—an unfortunate omission since production varies from year to year. The map showing the "principal railways of South America" (Fig. 29B, p. 71) fails to indicate some 700 miles of the longitudinal railway of Chile, which is one of the greater railway facts of the continent.

5. The great need of promoting the more efficient utilization of natural resources is recognized, but many of the statements which relate to their conservation seem to reflect only a slight acquaintance with the problems involved. The statement concerning the value of crop rotation (pp. 159–160), by implication complete, ignores its value in reducing the ravages of insects, in helping to overcome plant sickness (soil sickness), and in helping to prevent reduced yields through the influence of toxic bodies. The "danger" that the German reserves of potash "would prove insufficient" is assigned (p. 164) as a chief consideration which led the United States government to undertake a search for new sources of supply. Since the deposits near Stassfurt contain 2,000,000,000 tons of potash, enough to supply the world for some 2,000 years at the present rate of consumption, this "danger" manifestly was not imminent; and Congress, unaccustomed to look 2,000 years ahead, of course was moved by other considerations. In noting the sources of phosphates (pp. 163-164), no mention is made of the phosphate rock deposits of Utah, Idaho, Wyoming, and Montana—the largest known deposits in the world. Similarly in considering (pp. 199-200) what we shall do in the future for petroleum products or substitutes for them, no mention is made of the oil-shale deposits of Colorado, Wyoming, and Utah—the most important deposits of the kind known. In listing the varied uses of petroleum (pp. 196-197) the use of kerosene as an illuminant is not noted, although by another writer it has been aptly termed "one of the greatest of all modern agents of civilization." On page 203 the astonishing statement is made that when a satisfactory solar engine is available "we may hope at last to get rid of our coal mines." Surely Dr. Huntington has heard of the scores of products important in the arts, the industries, and medicine, that are derived from coal! The "great difficulty of the Mississippi waterway" is discussed on pages 138–139. Its channel depth of 9 feet to St. Louis apparently is considered adequate; but its lower course is winding, it is subject to seasonal floods, and especially it does not flow toward the eastern manufacturing districts and Europe. Then follows the categorical declaration that "if the Mississippi flowed from St. Louis to Baltimore or Philadelphia it would pay to spend a billion dollars instead of the hundred million already spent in improving [its] navigation." Reflection upon the fact that the Erie Barge Canal, with a channel depth of 12 feet and connecting the Great Lakes with the drowned Hudson, carries almost no freight might well cause one to hesitate about making such an unqualified declaration. The restricted use of the water power of this country (p. 149) certainly is not due to the impracticability until recently of transmitting the power any considerable distance from its source in the form of electric energy, but chiefly to unreasonable restrictions and hazards imposed by the Government prior to the passage of the Federal Water Power Act of 1920 and to the competition of power derived from coal and oil. In other words, the stagnation of water-power development continued for years after it was practicable to transmit the power long distances.

6. Various statements made in Chapter 19, on the world's diet, do not conform to the facts which have been definitely established by medical science. For example we are told (p. 350) that "a good diet must contain two main elements—carbohydrates and proteids" and that "in addition to these two main food substances certain others called vitamines, and the acids of fruits, are needed in smaller quantities." It is a well-known fact that to sustain life a diet must contain proteids, salts, and water, and that to promote growth and carry on body functions, either fats or carbohydrates are essential. That is one of these latter can replace the other for a time. A "good" diet should contain proteids, carbohydrates, fats, salts, water, and the accessory food factors—vitamines. "The Eskimo wants much fat because he needs carbohydrates to keep him warm in his far northern climate" (p. 354). But fats contain no carbohydrates. "Many equatorial people have protruding abdomens because of the great bulk of the bananas that they have to stuff down in the effort to satisfy their hunger. The bulkiness of the food in time ruins their digestion" (p. 355). It is the belief

of leading physicians that the physical deformities following such a one-sided diet are not due to the bulk of the diet, but that they are the result of nutritional diseases which are associated with improper muscle and bone development. Some grains grown in parts of the tropics "contain twice as much starch as is advisable, and when eaten exclusively render the people liable to certain diseases such as beri-beri" (p. 355). Beri-beri is due to the lack of water-soluble B vitamine in the diet and not to an excess of starch.

7. One of the greater weaknesses of the book is to be found in its many unwarranted generalizations, not a few of which clearly are due to the fact that climatic influences occupied too great a part of the authors' horizon. In earlier days immigrants from "the cool, stimulating climates of northwestern Europe" for the most part avoided the Southern States, preferring to go to the Northern States with their energizing climate (pp. 306–307). This statement inadequately explains the fact that most immigrants settled in the North, for it ignores, among other things, their unwillingness to compete with negro labor, the fact that almost all the immigrant ships ran to the northeastern seaports, and especially the greater demand for laborers by the mines, factories, and railroads of the North. Figures 111 and 112 (pp. 346 and 347) show that the foreign trade of the United States is largely with western Europe. The accompanying text, after commenting on the desirability of increasing our trade with tropical America, reads as follows: "Yet in spite of this it is far more difficult to add a billion dollars to our trade with tropical America than to add the same sum to our trade with cyclonic Europe. The reason is largely the difference in energy. The tropical people do not exert themselves to produce goods that we want, nor do they earn enough to be able to buy large quantities of the goods that we wish to sell. Hence most of the world's trade, as well as most of its other activity, centers in the cyclonic regions." Thus climate is made to explain the situation, while the historical background, differences of race, civilization, and stage of industrial development, the sources of the colonizing peoples of the western world, and the fact that the people of western Europe and of the northeastern United States have been attempting to obtain adjustment to similar environments and so have need of various things which each readily may produce for the other—to mention only a part of the other factors involved—all are ignored. Surely this is not scholarship! In passing it may be added that the sooner American geographers and business men seriously study the environment and the needs of tropical people, with a view to offering them *what they want*, instead of dwelling upon the fact that they do not buy *what we wish to sell*, the better it will be for American trade. Discussing elsewhere (p. 256) the influence of an invigorating climate on character, Dr. Huntington declares that it is much easier to speak the truth when one feels strong than when one feels weak. One wonders how this generalization was arrived at, while at the same time he congratulates himself that he lives in a climate which is said to make for strength and truthfulness. Not all the loose generalizations result from a habit of overemphasizing the influences of climate. In seeking, for example, to emphasize how Belgium became a victim to geographical location in the war, Dr. Huntington states on page 379 that "her people suffered more than did the chief parties to the quarrel" and that her material progress was set back for decades, overlooking the fact that the devastated zone lies chiefly in France, that Belgium secured large loans from her allies and was able to restore practically all of her railways and canals in two years from the time of the Armistice, that her mills are nearly or quite on a pre-war basis in spite of the loss of machinery to Germany, that her army was so small in proportion to her total population on account of the prompt overrunning of Belgium that in spite of deportations and other sources of loss her total casualties were relatively light, and that she has priority in the German indemnity payments. As a matter of fact Belgium is being reconstructed more rapidly than either France or England.

8. Numerous errors of various kinds appear to be due simply to carelessness and can be explained only by assuming that Dr. Huntington wrote much of the book in more than his usual haste. Thus we are told that Missouri is level (p. 85), that Detroit is on a lake (p. 122), that practically every river is subject to droughts and freezing (p. 134), that "the mountainous relief of Arizona causes that State to produce minerals worth more than $40,000,000 each year" (p. 167), that "in mid ocean during a storm or a battle a warship can safely [!] renew its supply of petroleum by pumping the liquid from a tender through a hose" (pp. 196–197), and that "the sun shines practically all the time in irrigated regions" (p. 325). Chile is not mentioned among the countries containing and producing much copper (p. 183), though its reserves probably exceed those of any other country except the United States and it ranked second in production in 1918; and Alaska is said to have been purchased by

the United States in part because it "is full of valuable minerals" (p. 398), though this fact [?] was not known in 1867. We are told that "some regions, . . . such as Montana, have few inhabitants because rugged mountains provide almost no place for people to live" (p. 2). Montana is an unfortunate example of the fact stated, since most of that state is not mountainous and throughout most of its history the densest population has been in its mountainous part. On page 169 one reads that "among the urban population of this country who have a small surplus for investment there are only a few [!] who have not lost money in mining ventures. They ought to know that the vast majority of mines do not pay." Presumably what Dr. Huntington meant to say is that large numbers of urban people have lost money in mining ventures. Surely it does "not pay" for scientists to make such wild statements. In not a few cases careless statements result in contradictions. For example, on page 294 Utah in its climate is said to "share many of the qualities of the Mediterranean subtropical regions," while on page 309 it is cited as an example of a "continental desert." In many cases a word of qualification would have transformed an objectionable statement into an acceptable one. Thus one cannot accept the statement (p. 289) that "in the Hawaiian Islands the absence of any duty on sugar imported into the United States has made sugar-raising the dominant industry," though of course it *helped* greatly to do so.

In view of its several good qualities it is to be hoped that the book will receive an early and thorough revision. As it stands, it is unreliable, unscientific, and displays a weak grasp of *principles*, a serious defect in a book with this title.

HARLAN H. BARROWS

SOUTH AMERICAN CLIMATOLOGICAL LITERATURE

M. M. WELCH. **Bibliography on the Climate of South America.** 42 pp. *Monthly Weather Rev. Suppl. No. 18*, U. S. Dept. of Agriculture, 1921.

This bibliography, particularly useful in view of the scattered nature of records of South America climate, gives references to data appearing in individual works and periodical literature up to January, 1919, with a few important additions of later date. The arrangement is according to countries.